

# DISCLOSURES

Intel Technology and Manufacturing Day 2017 occurs during Intel's "Quiet Period," before Intel announces its 2017 first quarter financial and operating results. Therefore, presenters will not be addressing first quarter information during this year's program.

Statements in this presentation that refer to forecasts, future plans and expectations are forward-looking statements that involve a number of risks and uncertainties. Words such as "anticipates," "expects," "intends," "goals," "plans," "believes," "seeks," "estimates," "continues," "may," "will," "would," "should," "could," and variations of such words and similar expressions are intended to identify such forward-looking statements. Statements that refer to or are based on projections, uncertain events or assumptions also identify forward-looking statements. Such statements are based on management's expectations as of March 28, 2017, and involve many risks and uncertainties that could cause actual results to differ materially from those expressed or implied in these forward-looking statements. Important factors that could cause actual results to differ materially from the company's expectations are set forth in Intel's earnings release dated January 26, 2017, which is included as an exhibit to Intel's Form 8-K furnished to the SEC on such date. Additional information regarding these and other factors that could affect Intel's results is included in Intel's SEC filings, including the company's most recent reports on Forms 10-K, 10-Q and 8-K reports may be obtained by visiting our Investor Relations website at [www.intc.com](http://www.intc.com) or the SEC's website at [www.sec.gov](http://www.sec.gov).



# LEADING AT THE EDGE

TECHNOLOGY AND MANUFACTURING DAY

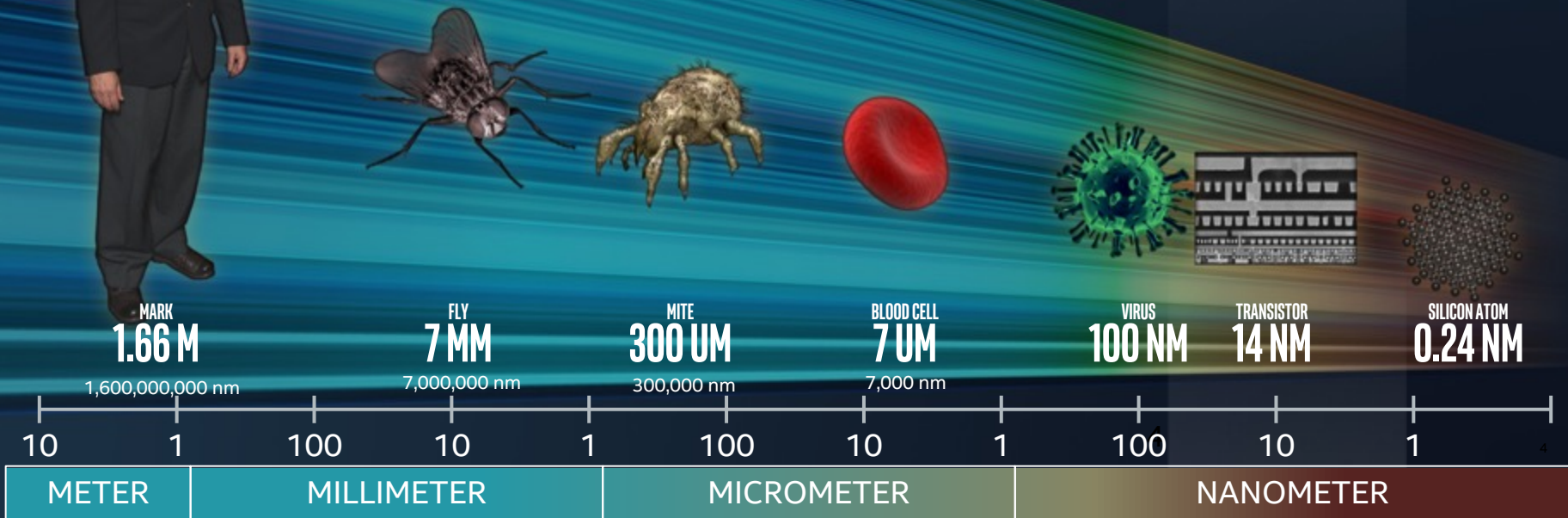


# STRATEGY OVERVIEW

STACY J. SMITH

Executive Vice President  
Manufacturing, Operations and Sales

# HOW SMALL IS 14 NM?





*"The number of transistors and resistors  
on a chip doubles every 24 months"*

*-Gordon Moore*

## **Two Implications:**

1. Cost per square millimeter goes up over time
2. Doubling of transistors = "Scaling"
  - Improves performance
  - Cost per transistor declines

# WHAT IF MOORE'S LAW IS APPLIED TO...

## TRANSPORTATION?



We could travel to the Sun on a single gallon

## AGRICULTURAL PRODUCTIVITY?



We could feed the world's population with 1km<sup>2</sup> of land

## SPACE TRAVEL?



We could travel at 300x light-speed

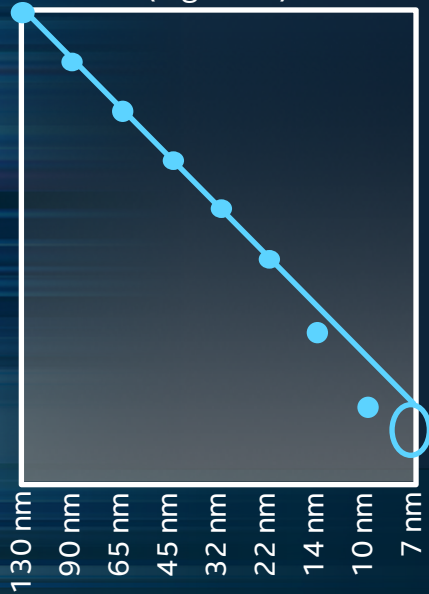
Source: Intel estimates.

# IS MOORE'S LAW DEAD?

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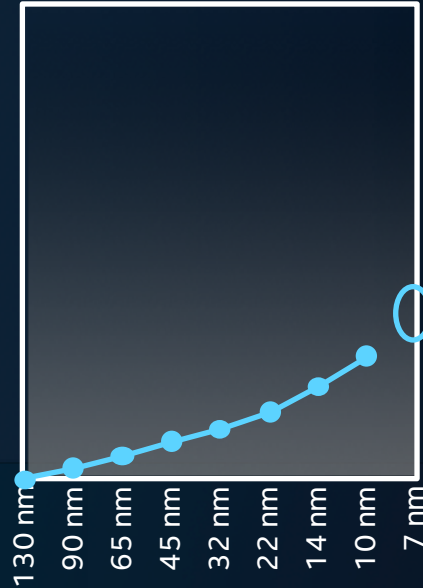
# IS MOORE'S LAW DEAD? NO!

mm<sup>2</sup> / Transistor  
(log scale)



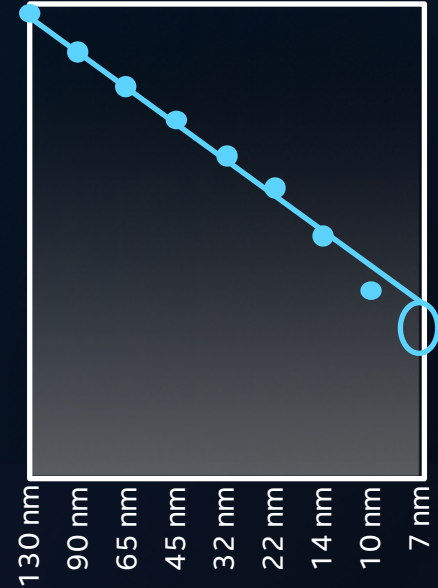
×

\$ / mm<sup>2</sup>  
(log scale)



=

\$ / Transistor  
(log scale)



10 nm and 7 nm forecasts are Intel estimates, based upon current expectations and available information.  
Source: Intel

*The time between nodes  
has lengthened...*

**ARE YOU GETTING THE SAME  
MOORE'S LAW BENEFIT?**



# YES!

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*Because we are getting  
more scaling*

# WE ARE HYPER SCALING

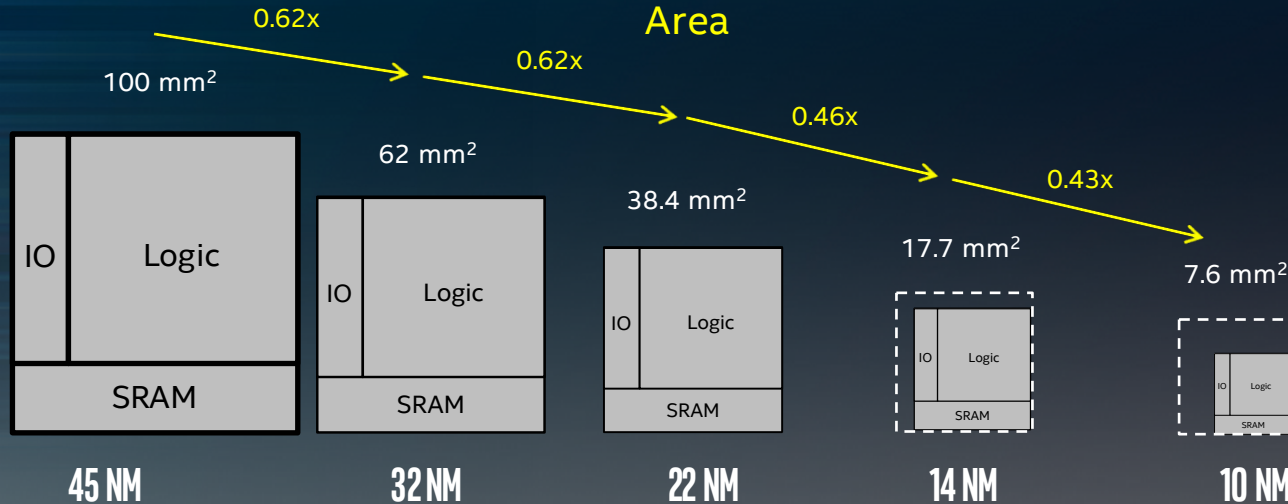
(on 14 nm & 10 nm)

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*Hyper scaling enables us to achieve  
accelerated density improvement*

*Intra-node optimizations enable an annual  
cadence of product enhancements*

# MICROPROCESSOR DIE AREA SCALING

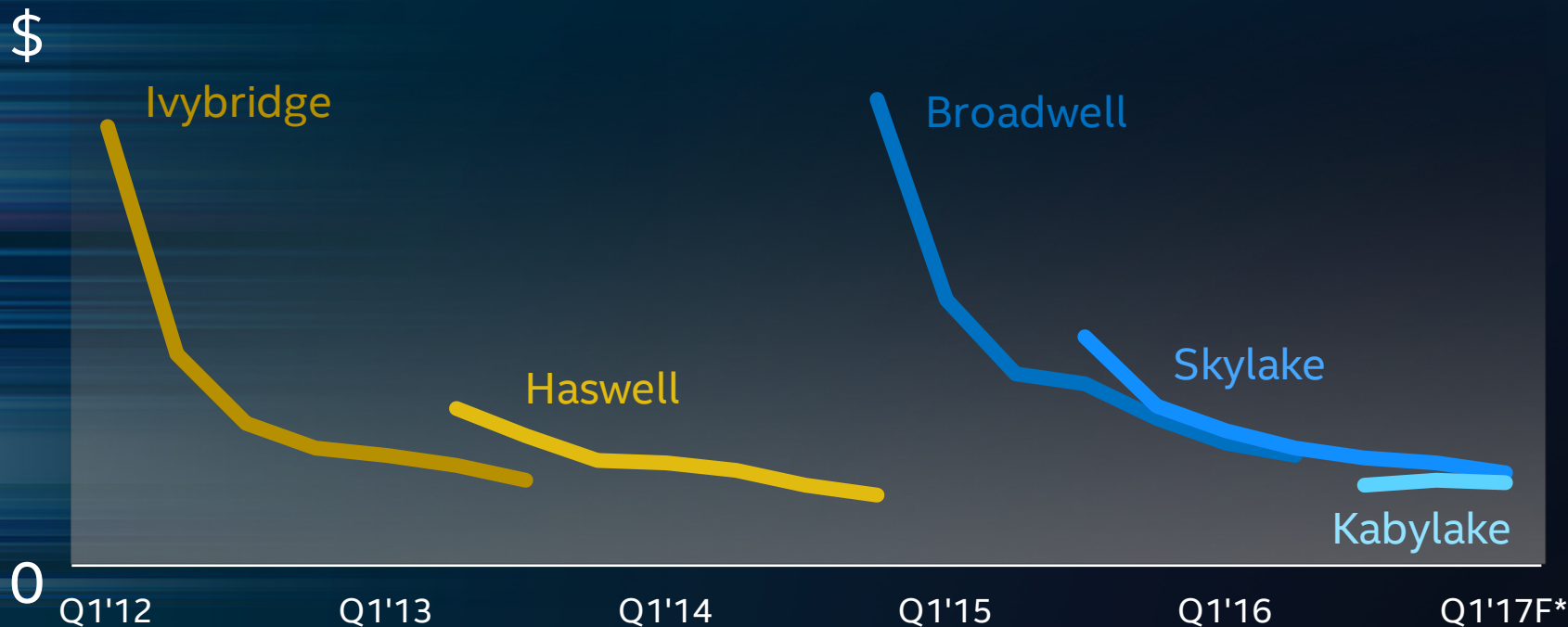


Hyper scaling delivers 0.46–0.43x die area scaling on 14 nm and 10 nm

10 nm forecast is an Intel estimate, based upon current expectations and available information.  
Source: Intel

# MOORE'S LAW TRANSLATES TO LOWER PRODUCT COSTS

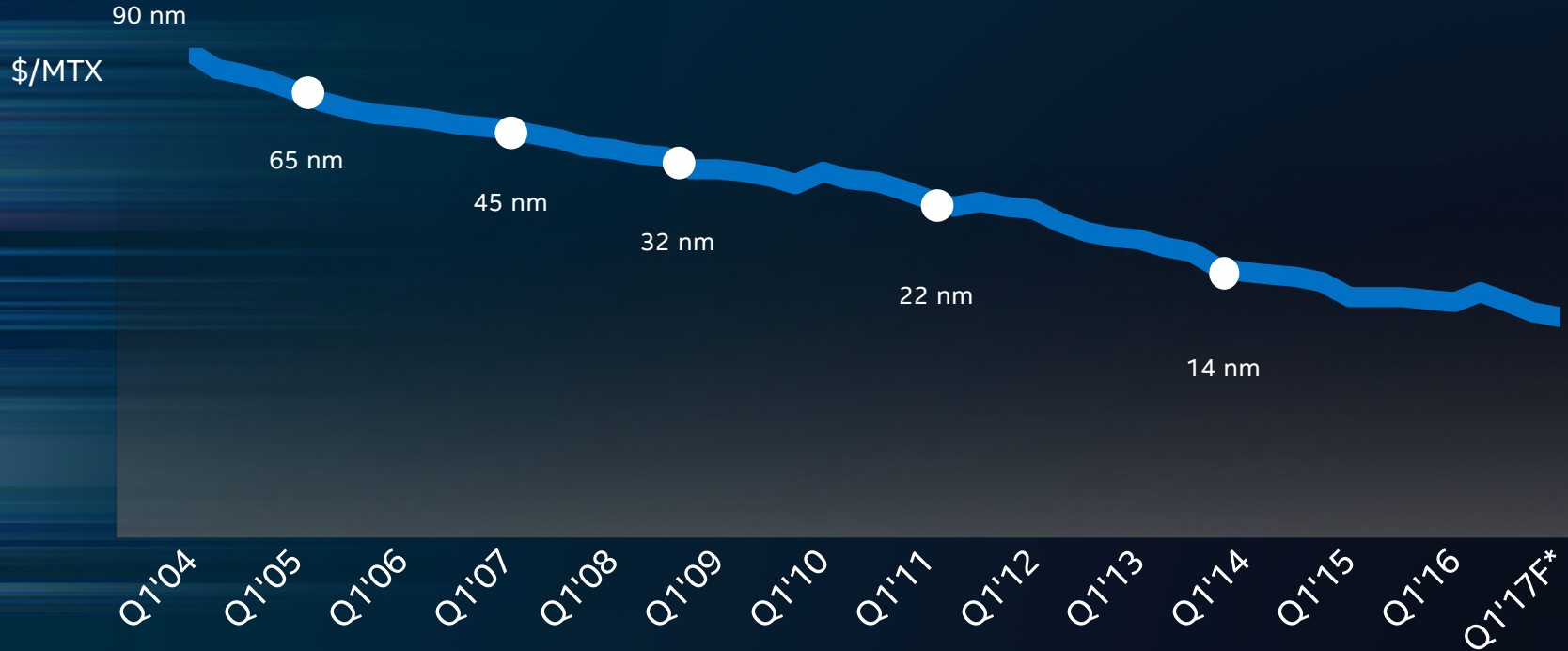
22 nm & 14 nm Client Cost Curves  
(Launch + 5 quarters)



\*Q1'17 forecast is an Intel estimate, based upon current expectations and available information.  
Source: Intel

# MOORE'S LAW IN ACTION...

PC CPU Weighted Average Cost Per Transistor (\$/MTX)  
(log scale normalized to 90 nm)



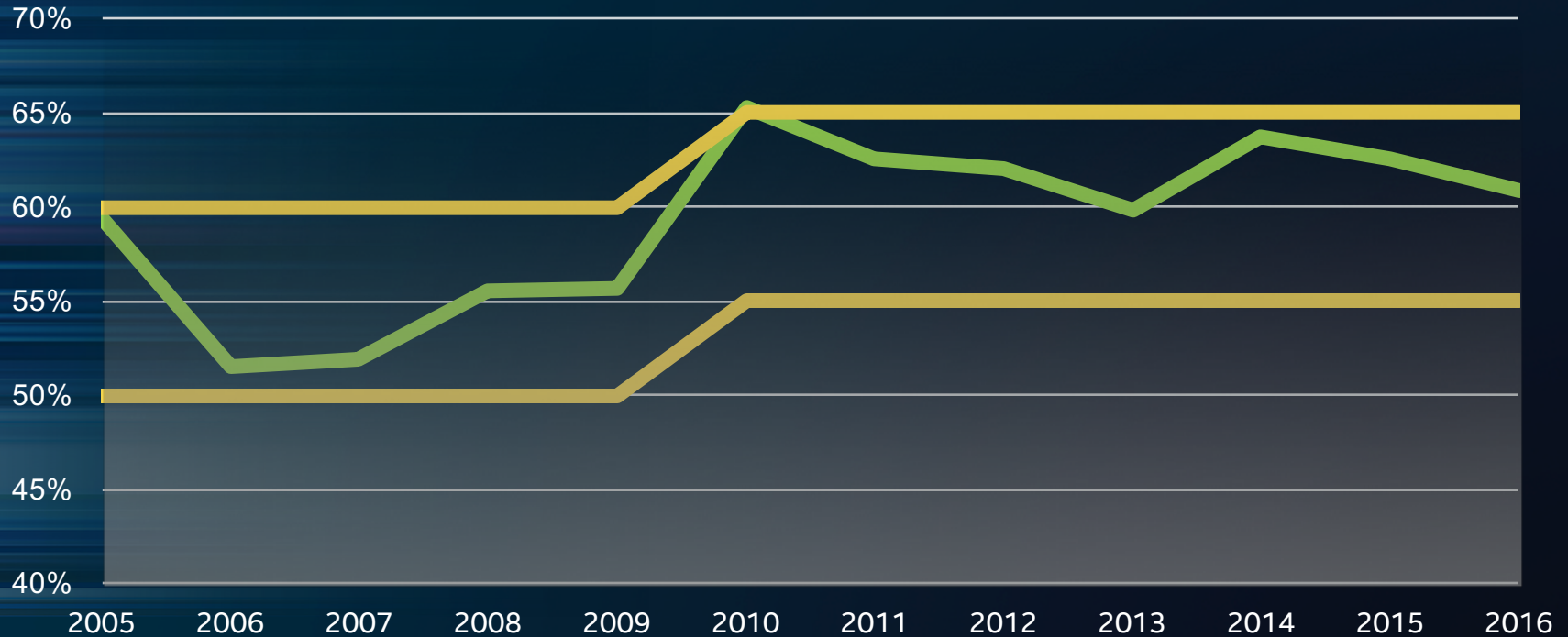
\*Q1'17 forecast is an Intel estimate, based upon current expectations and available information.

Source: Intel



# GROSS MARGINS

Gross Margin % Annual 2005 - 2016



Source: Intel

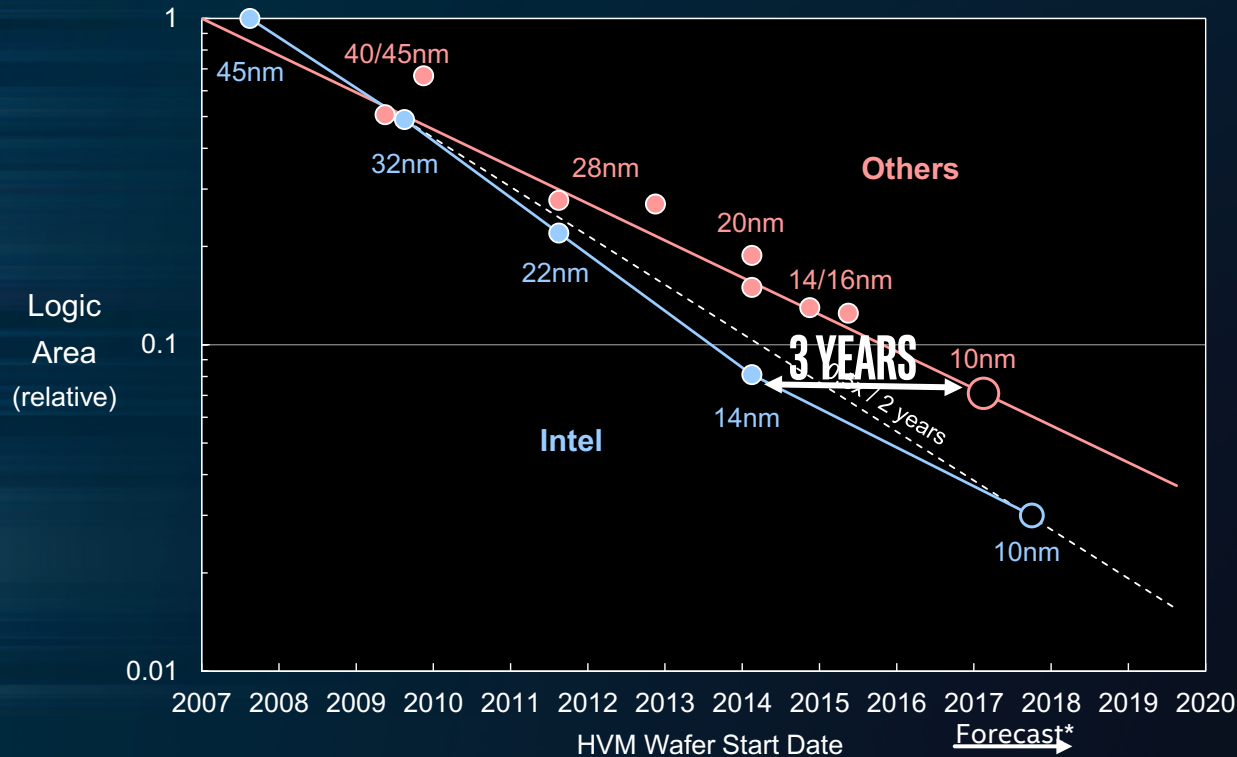
*Competitors are  
announcing 10nm this year...*

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**HAVE YOU LOST YOUR LEAD?**

# HAVE YOU LOST YOUR LEAD? NO!

## 14 NM IS ~3 YEARS AHEAD



\*Forecast is an estimate, based upon current expectations and available information.

Source: Intel estimates.

# OUR SCALE

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# INVESTMENT REQUIRED TO BUILD & EQUIP A LEADING EDGE WAFER FACTORY

~\$10B

Source: Intel



# SI TECHNOLOGY IS BECOMING RARE

NUMBER OF PLAYERS WITH A LEADING EDGE LOGIC FAB



Other names and brands may be claimed as the property of others.  
Source: Amalgamation of analyst data and Intel analysis.

# FAB AND ASSEMBLY TEST SITES



Source: Intel

# GLOBAL MANUFACTURING BY THE NUMBERS

INTEL EMPLOYEES

**~30K**

MANUFACTURING SPACE

**>4M**

SQUARE FEET  
OF CLEANROOM

TRANSISTORS

**>10B**

MANUFACTURED  
PER SECOND

# UNITED STATES FOOTPRINT

US HIGH TECH JOBS

**+50K**

CONTRIBUTION  
TO US GDP

**~\$90B**

\$24B DIRECT  
GDP CONTRIBUTION

LARGEST US HIGH-TECH  
CAPITAL INVESTOR

**~\$7B**

ANNUAL AVERAGE  
2011 – 2015

Over half of our high tech manufacturing jobs are in the US  
80% of our revenue comes from outside the US

Source: Amalgamation of analyst data and Intel analysis.

# WORLD CLASS SUPPLY CHAIN

**Gartner**  
Supply Chain Top 25

2016

MASTER Apple

MASTER Proctor & Gamble

1. Unilever

2. McDonald's

3. Amazon.com

**4. Intel**

5. H&M

6. Inditex

7. Cisco Systems

8. Samsung Electronics

9. The Coca-Cola Company

10. Nestlé

Other names and brands may be claimed as the property of others.

Source: Gartner

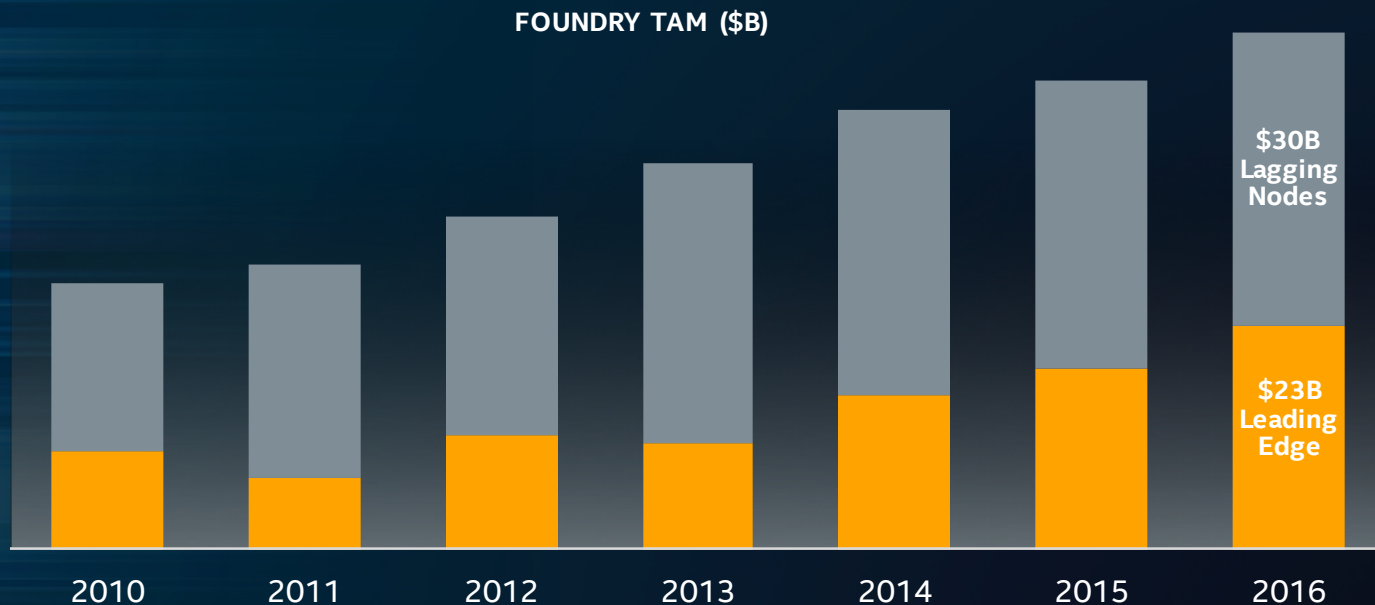




# INTEL CUSTOM FOUNDRY

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# THE OPPORTUNITY ~ LEADING EDGE FOUNDRY MARKET IS GROWING

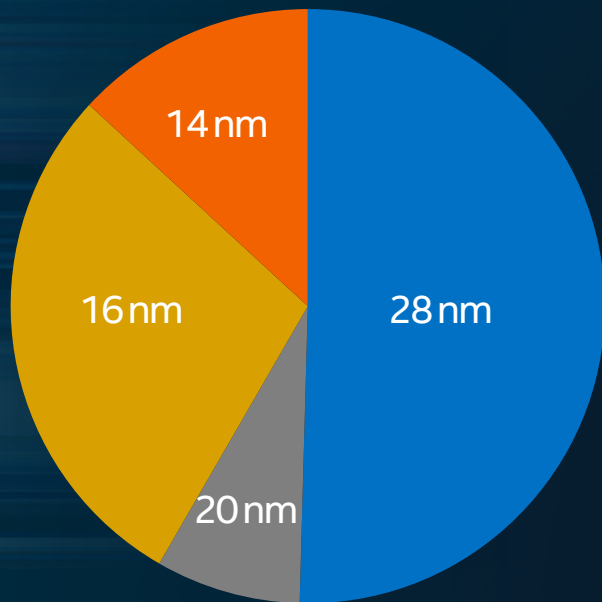


Note: Samsung and Intel internal are excluded from TAM. Leading edge defined as: 65nm and below for 2010, 45nm and below for 2011 and 2012, 32 nm and below for 2013-2016.

Source: Amalgamation of analyst data and Intel analysis.

# 2016 LEADING EDGE FOUNDRY MARKET

LEADING EDGE  
FOUNDRY TAM BY NODE



2016 TAM (\$B)

**\$23B**

GROWING AT 14%  
(CAGR 2010 - 2016)

Note: Samsung and Intel internal are excluded from TAM. Leading edge defined as: 28 nm and below for 2016.

Source: Amalgamation of analyst data and Intel analysis.

# INTEL CUSTOM FOUNDRY

## LEADERSHIP TECHNOLOGY & IP



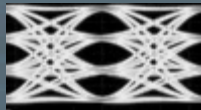
Strained Silicon



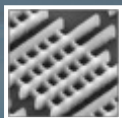
FPGA



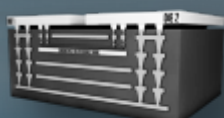
High-k Metal Gate



Optical & Serdes IP



FinFET Transistor



EMIB



## ROBUST ECOSYSTEM

ANSYS



Aricent

ARM

asicNorth

cādence®



Mentor  
Graphics



SANKALP  
semiconductor

SYNAPSE  
design

synopsys®



CO-OPTIMIZED  
PROCESSES  
IN CONJUNCTION  
WITH  
CUSTOMERS

Bringing tomorrow's technology today with comprehensive foundry services

Other names and brands may be claimed as the property of others.

# INTEL CUSTOM FOUNDRY ~ ENABLING FINFET CAPABILITIES

A blue circular icon with a white grid pattern. The text "22 nm" is in a large font, and "GP" is in a smaller font below it.

22 nm  
GP

1<sup>st</sup> gen FinFET technology focused on the networking market

A blue circular icon with a white grid pattern. The text "14 nm" is in a large font.

14 nm

2<sup>nd</sup> gen FinFET technology in mass production targeting networking, FPGA and mobile SOC markets

A blue circular icon with a white grid pattern. The text "10 nm" is in a large font.

10 nm

3<sup>rd</sup> gen FinFET technology, targeting high performance client and mobile markets

Proven Capability: Intel has manufactured ~7M FinFET wafers

# INTRODUCING 22FFL PLATFORM

**Extreme Integration Capability**

**Cost Effective Design**



**Fast Time to Market**

**FinFET for the masses**



Automotive



Wearable Devices



Smartphones

**Ideal for highly integrated, cost sensitive products requiring a combination of high performance and ultra low power**



# PUTTING IT ALL TOGETHER

We continue to advance Moore's Law  
resulting in significant product and cost benefits

We continue to outpace the rest of the industry  
(~3 year lead on 14nm)

Our scale is a unique competitive advantage

We are building a foundry franchise

Source: Intel estimates

# ONE MORE THING...

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# INTEL'S LEADERSHIP RESPONSIBILITIES



## *Addressing critical Sustainability and Human Rights issues*

- Sourcing minerals responsibly
- Caring for the environment
- Promoting human rights programs
- Supply chain free of forced and bonded labor
- Reducing waste, water and carbon footprint

Inspiring employees, shareholders, customers